CLAIMS

1. A pullulan free edible film composition comprising:

(a) an effective amount of a film forming agent; and

(b) an effective amount of an antimicrobial agent wherein the antimicrobial agent comprises cinnamaldehyde.

2. The composition of claim 1 wherein the film forming agent comprises a mixture of a maltodextrine, a filler, and a hydrocolloid.

3. The composition of claim 2 wherein the maltodextrine comprises about 5 wt.% to about 60 wt.% of the edible film.

4. The composition of claim 2 wherein the maltodextrine comprises about 20 wt.% to about 40 wt.% of the edible film.

5. The composition of claim 2 wherein the hydrocolloid comprises about 10 wt.% to about 50 wt.% of the edible film.

6. The composition of claim 2 wherein the hydrocolloid comprises about 20 wt.% to about 30 wt.% of the edible film.

7. The composition of claim 2 wherein the filler comprises about 5 wt.% to about 30 wt.% of the edible film.

8. The composition of claim 2 wherein the filler comprises about 15 wt.% to about 25 wt.% of the edible film.

9. The composition of claim 2 wherein the hydrocolloid comprises a material selected from the group consisting of a natural gum, a biosynthetic gum, a natural seaweed, a natural plant extrudate, a natural fiber extract, a gelatin, a

biosynthetic process starch, a cellulosic material, an alginate, pectin, and combinations thereof.

10. The composition of claim 9 wherein the natural gum comprises a gum selected from the group consisting of natural seed gum, guar gum, locust gum, tara gum, gum arabic, ghatti gum, agar gum, and xanthan gum.

11. The composition of claim 9 wherein the alginate comprises sodium alginate or calcium alginate.

12. The composition of claim 9 wherein the natural seaweed comprises a carrageenan.

13. The composition of claim 2 wherein the filler comprises a food-grade bulk filler selected from the group consisting of microcrystalline cellulose, a cellulose polymer, magnesium carbonate, calcium carbonate, ground limestone, a silicate, clay, talc, titanium dioxide, a calcium phosphate, and combinations thereof.

14. The composition of claim 13 wherein the cellulose polymer comprises wood.

15. The composition of claim 13 wherein the silicate comprises magnesium or aluminum silicate.

16. The composition of claim 13 wherein the calcium phosphate comprises mono-calcium phosphate, di-calcium phosphate, or tri-calcium phosphate.

17. The composition of claim 1 wherein the cinnamaldehyde comprises at about 1 wt.% to about 25 wt.% of the edible film.

18. The composition of claim 1 wherein the cinnamaldehyde comprises about 6 wt.% to about 25 wt.% of the edible film.

19. The composition of claim 1 wherein the concentration of cinnamaldehyde comprises one of about 5 wt.%, about 8 wt.%, less than about 20 wt.%, and above about 21 wt.% of the edible film.

20. The composition of claim 1 wherein the composition of claim 1 wherein the concentration of cinnamaldehyde comprises above about 1 wt. % of the edible film.

21. The composition of claim 1 further comprising an effective amount of a medicament.

22. The composition of claim 21 wherein the medicament comprises an oral cleansing or breath freshening compound selected from the group consisting of a pH control agent, inorganic components for tartar or caries control, a breath freshening agent, an anti-plaque/anti-gingivitis agent, a saliva stimulating agent, a pharmaceutical agent, a nutraceutical agent, a vitamin, a mineral, and combinations thereof.

23. The composition of claim 22 wherein the pH control agent comprises urea.

24. The composition of claim 22 wherein the inorganic components for tartar or caries control comprise phosphates or fluorides.

25. The composition of claim 22 wherein the breath freshening agent agent comprises zinc gluconate.

26. The composition of claim 22 wherein the anti-plaque/anti-gingivitis agent comprises cholorhexidene, CPC, or triclosan.

27. The composition of claim 22 wherein the saliva stimulating agent comprises a food acid.

28. The composition of claim 27 wherein the food acid comprises an acid selected from the group consisting of citric, lactic, maleic, succinic, ascorbic, adipic, fumaric, and tartaric acids.

29. The composition of claim 1 further comprising an effective amount of a softening agent.

30. The composition of claim 29 wherein the softening agent comprises about 0 wt% to about 20 wt % of the edible film.

31. The composition of claim 29 wherein the softening agent comprises about 2 wt% to about 10 wt% of the edible film.

32. The composition of claim 29 wherein the softening agent comprises a plasticizer including a compound selected from the group consisting of sorbitol, glycerin, polyethylene glycol, propylene glycol, hydrogenated starch hydrolysates, corn syrup, and combinations thereof.

33. The composition of claim 1 further comprising an effective amount of a coloring agent.

34. The composition of claim 1 further comprising an effective amount of a flavoring agent.

35. The composition of claim 34 wherein the flavoring agent comprises about 0.1 wt% to about 20 wt % of the edible film.

36. The composition of claim 34 wherein the flavoring agent comprises about 10 wt% to about 15 wt% of the edible film.

37. The composition of claim 34 wherein the flavoring agent comprises a material selected from the group consisting of essential oils, synthetic flavors, fruit essences, anise, flavor oils with germ killing properties, and mixtures thereof.

38. The composition of claim 37 wherein the essential oils comprises citrus oil, peppermint oil, spearmint oil, mint oil, clove oil, oil of wintergreen.

39. The composition of claim 37 wherein the flavor oils with germ killing properties comprise menthol, eucalyptol, thymol, and combinations thereof.

40. The composition of claim 1 further comprising an effective amount of an emulsifying agent.

41. The composition of claim 40 wherein the emulsifying agent comprises lecithin, ($C_{10}$-$C_{18}$) fatty acids, mono and diacyl glycerides, ox bile extract, polyglycerol esters, polyethylene sorbitan esters, propolyene glycol, sorbitan monopalmitate, sorbitan monosterate, sorbitan tristerate, enzyme modified lecithin, hyroxylated lecithins, and combinations thereof.

42. A method of oral cleansing by applying a pullulan-free edible film to the oral cavity, wherein the edible film comprises:

(a) an effective amount of a film forming agent; and

(b) an effective amount of an antimicrobial agent wherein the antimicrobial agent comprises cinnamaldehyde.

43. The method of claim 42 wherein the cinnamaldehyde comprises at least about 1 wt% of the edible film.

44. The method of claim 42 wherein the cinnamaldehyde comprises about 6 wt.% to about 25 wt.% of the edible film.

45. The method of claim 42 wherein the cinnamaldehyde concentration comprises one of about 5 wt.%, about 8 wt.%, less than about 20 wt.%, and above about 21 wt.% of the edible film.

46. The method of claim 42 wherein the film forming agent comprises a mixture of a maltodextrine, a filler, and a hydrocolloid.

47. The method of claim 46 wherein the maltodextrine comprises about 5 wt.% to about 60 wt.% of the edible film.

48. The method of claim 46 wherein the hydrocolloid comprises about 10 wt.% to about 50 wt.% of the edible film.

49. The method of claim 46 wherein the filler comprises about 5 wt.% to about 30 wt.% of the edible film.

50. The method of claim 46 wherein the hydrocolloid comprises a material selected from the group consisting of a natural gum, a biosynthetic gum, a natural seaweed, a natural plant extrudate, a natural fiber extract, a gelatin, a biosynthetic process starch, a cellulosic material, an alginate, pectin, and combinations thereof.

51. The method of claim 50 wherein the natural gum comprises a gum selected from the group consisting of natural seed gum, guar gum, locust gum, tara gum, gum arabic, ghatti gum, agar gum, and xanthan gum.

52. The method of claim 50 wherein the alginate comprises sodium alginate or calcium alginate.

53. The method of claim 50 wherein the natural seaweed comprises a carrageenan.

54. The method of claim 46 wherein the filler comprises a food-grade bulk filler selected from the group consisting of microcrystalline cellulose, a cellulose polymer, magnesium carbonate, calcium carbonate, ground limestone, a silicate, clay, talc, titanium dioxide, a calcium phosphate, and combinations thereof.

55. The method of claim 54 wherein the cellulose polymer comprises wood.

56. The method of claim 54 wherein the silicate comprises magnesium or aluminum silicate.

57. The method of claim 54 wherein the calcium phosphate comprises mono-calcium phosphate, di-calcium phosphate, or tri-calcium phosphate.

58. The method of claim 42 wherein the edible film further comprises one or more of a medicament, a softening agent, a coloring agent, a flavoring agent, and an emulsifying agent.

59. The method of claim 42 wherein the edible film delivers at least about 0.1wt% cinnamaldehyde to the oral cavity.

60. The method of claim 42 wherein the edible film delivers at least about 0.01wt% cinnamaldehyde to the oral cavity.

61. The method of claim 42 wherein the edible film delivers at least about 0.005wt% cinnamaldehyde to the oral cavity.

62. A method of making a pullulan-free edible film comprising:

(a) forming an aqueous solution that includes a maltodextrin, a hydrocolloid, and a filler;

(b) adding an effective amount of an antimicrobial agent to the aqueous solution, wherein the antimicrobial agent comprises cinnamaldehyde; and

(c) drying the aqueous solution to form a dry edible film.

63. The method of claim 62 wherein adding an effective amount of an antimicrobial agent comprises adding sufficient cinnamaldehyde such that the dry edible film comprises at least about 1 wt% cinnamaldehyde.

64. The method of claim 62 wherein adding an anti-microbial agent comprises adding sufficient cinnamaldehyde such that the dry edible film comprises about 1 wt.% to about 25 wt.% cinnamaldehyde.

65. The method of claim 62 wherein forming an aqueous solution comprises adding sufficient maltodextrine such that the dry edible film comprises about 5 wt.% to about 60 wt.% maltodextrine.

66. The method of claim 62 wherein forming an aqueous solution comprises adding sufficient hydrocolloid such that the dry edible film comprises about 10 wt.% to about 50 wt.% hydrocolloid.

67. The method of claim 62 wherein forming an aqueous solution comprises adding sufficient filler such that the dry edible film comprises about 5 wt.% to about 30 wt.% filler.

68. The method of claim 62 wherein forming an aqueous solution further comprises adding one or more of a medicament, a softening agent, a coloring agent, a flavoring agent, and an emulsifying agent.

69. The method of claim 62 further comprising heating the aqueous solution to a temperature of about 40°C to about 60°C prior to drying the aqueous solution.

70. A treatment method for reducing the number or activity of bacteria in the oral cavity comprising the steps of:

(a) providing an edible film composition comprising cinnamaldehyde in an amount sufficient to kill or deactivate oral bacteria; and

(b) causing a person in need of the treatment to consume the edible film composition whereby the bacteria in the oral cavity of the person is reduced or inactivated by the treatment.